REMARKS

Claims 1 to 19 are in this case. Claims 12 to 17 stand withdrawn from consideration as being directed to a non-elected invention.

The drawings were objected to because Figs. 1a-1c, 2, 3 and 4 should be designated by a legend such as "Prior Art" and corrected drawings labeled "Replacement Sheet" were required. The drawings have now been amended with the required Replacement Sheets and are no longer subject to objection.

Claims 1-11 stand rejected under 35 U.S.C. 112 for the reasons set forth at Pages 3 and 4 of the Office Action. Specifically, it is alleged that:

(i)"claims 1, 3, and 4 fail to use proper Markush language". The claims have been amended to obviate this ground of rejection. (ii) Also regarding claim 1: "it is not clear what is meant by "non-leaching". It is submitted that the term has the meaning as given at page 1, lines 4 and 5, and as further illustrated at lines 6 to 14, and at page 5, lines 1 to 8, i.e. the adhesive system when in contact with liquid or liquid film present in an application in which the cured adhesive system is used, does not leach compounds that are detrimental to the application. To expedite the prosecution of this application, the claims have been amended to recite this definition.

(iii)"the kinds of polymerizable groups present in the hybrid monomers should be clearly recited in the claim". It is submitted that such a requirement is unduly limiting in view of the disclosure in the present specification that any monomer polymerizable by free radical initiation may be used. The claims are addressed to those of ordinary skill in the art who will be

fully apprised of the invention as presently set forth in the claims.

(iv) "if the adhesive system requires a non-thiol monomer and thiol monomer, this should be clearly set forth in the claim". The claims as amended now obviate this ground of rejection.

(v) Regarding claim 2: "it is not clear whether the monomer is required to contain two polymerizable groups that are the same, two polymerizable groups that are chemically different from each other, or one functional group and one polymerizable group or two functional groups that are also polymerizable (same or different)". The claims as amended now obviate this ground of rejection.

(vi)Regarding claim 4: "Additionally, it is not clear what the scope of "ethoxylated homologs of these compounds" is. The claim should clearly state what homologs are included". Again, it is submitted the claims are addressed to those of ordinary skill in the art who will be fully apprised of the invention as presently set forth in the claims.

(vii)Regarding the grounds for rejection of claims 5,6 and 8 set forth at page 4 of the Office Action, the claims as amended are no longer subject to these grounds of rejection.

Claims 1-11 stand rejected under 35 U.S.C. 102 (e) as being anticipated by Kitsunai et al, US Patent 6,627,287.

Claims 1-11 stand rejected under 35 U.S.C. 102 (b) as being anticipated by Ha et al, US Patent 6,180,200.

Claims 1-11 stand rejected under 35 U.S.C. 102 (b) as being anticipated by Tokuda et al, US Patent 6,017,603.

Claims 1-11 stand rejected under 35 U.S.C. 102 (b) as being anticipated by Iida, US Patent 6,171,675.

Claims 1-9 stand rejected under 35 U.S.C. 102 (b) as being anticipated by, or in the alternative, under 35 U.S.C. 103 (a) as

being unpatentable over Takahashi et al, US Patent 5,366,812.

It is submitted that all of the rejections are untenable and should be withdrawn.

The present invention relates to a non-leaching adhesive system, which does not leach any harmful components or impurities into a liquid which is or becomes into contact with said adhesive system, when it has been cured. As further defined in the specification at pages 1-2, lines 1 to 15,

> the term 'non-leaching' as used herein refers to the absence of the leaching of compounds that are detrimental to the application in which the adhesive is used. Examples of such applications are the use in deep-UV mastering of high-density optical discs, the use in deep-UV lithography of silicon wafers, the use in liquid immersion lithography and in immersion microscopy in the biological field. Further important applications are in the assembly of catheters and other biomedical devices for applications likely to come into contact with fluids and tissue as well as in the construction of biosensors, notably those which contain assembled microfluidic structures. Also many applications are found in the veterinary and food & beverage industry. It is in such applications of the utmost importance that the liquid which comes into contact with the cured adhesive remains extremely pure, thus free of any contamination. See the specification at page 1, lines 1 to 15.

As further stated in the specification,

> in liquid immersion microscopy, for example, the numerical aperture (NA) and consequently the resolution of the microscope objective is increased by applying an immersion liquid between the steady lens and a steady object. The adhesive forces of the liquid keep the object immersed. When the object moves, however, breakdown of immersion may occur, either by pulling the liquid away from the lens or by pulling gas under the objective. The key issue in applying liquid immersion in a dynamic system such as a mastering machine therefore is to maintain a stable liquid film between the stationary lens and the moving substrate.
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> In critical applications such as for example deep-UV mastering of high density (Blu-ray Disc) optical discs using a high NA liquid immersion objective for writing of information in a

photo-resist layer on a master disc, the proper development of the photo-resist is often impeded by a low concentration of impurities in the immersion liquid. This contamination (which might be very little) is due to leaching of impurities from adhesives used in constructing the objective and immersion accessory.

Conventionally, two-component epoxy-amine or epoxy-anhydride adhesive systems are used. It then often occurs that alkaline impurities from the adhesive, or, when the adhesive has been dosed, mixed and/or cured improperly, unreacted amines, leach into the water phase and next into the resist. (Even epoxy - anhydride systems may contain leachable tertiary amine accelerators). The aimed contrast between exposed and non-exposed areas will then, locally, be changed or even removed, showing up as point defects or as stains in the master disc. Such defects will thereafter also be transferred to the stampers and replicated discs made from such master discs.

The same problem of a partially or totally undeveloped resist has been observed with several positive tone resists, belonging for example to the novolac-diazoquinone type of resists. (Specification, page 1, lines 23 to 28 and page 2, lines 1 to 11).

The present invention provides an adhesive system which does not leach harmful impurities or components, and thus allows proper development of the exposed resist layer and subsequent stamper manufacturing.

Comparative example 1 of the present specification effectively illustrates the prior art in which discs were replicated from stampers made using a liquid immersion microscope system as outlined in Fig. 1c that was constructed by using a conventional epoxy-amine adhesive, namely Araldite 2011 (trademark of Vantico). The discs thus produced showed many point defects and stains as shown in Figs. 2 and 3. The defects were already present on the stamper used for replicating the disks (Fig. 4).

Kitsunai et al is directed to improving the normally insufficient adhesion of UV-curable adhesive compositions to substrates having a reflecting layer of a silicon compound through the use of about 0.1 to 5 parts of a silane coupling agent such as

an epoxy silane or a (meth)acrylsilane. While various (meth)acrylate monomers are disclosed, polymerizable compositions are disclosed to lack adhesion unless a silane coupling agent is also present. While a silane coupling agent/surface active agent may also be employed herein, attention is directed to Examples 1 and 2 of the present specification wherein satisfactory results are obtained using the adhesive systems of the invention in the absence of silane coupling agent. Non-leaching adhesives are not disclosed.

Ha et al relates to numerous cationic and hybrid free radical radiation-curable compositions for bonding DVD components including a composition comprising an acrylate oligomer, a free radical initiator, up to 99 % of an epoxy resin, a diol, and a cationic initiator. Cationic cure adhesive compositions are also encompassed although as pointed out in the instant specification, such adhesives are not non-leaching when cured. (See comparative example 1 of the instant specification). Non-leaching adhesives are not disclosed.

Tokuda et al discloses numerous UV-curable adhesive compositions including a radiation curable adhesive composition having the essential ingredients (A)a bisphenol type epoxy(meth)acrylate, (B)a urethane (meth)acrylate, (C) a meth)acrylate monomer other than (A) or (B) and (F) a photopolymerization initiator. It is asserted that Tokuda et al teach compositions comprising the compound recited in claim 5. Applicants have read and re-read the patent but do not find this material specifically disclosed. The Examiner is requested to more specifically point out where it is disclosed. Non-leaching adhesives are not disclosed.

Iida discloses adhesive compositions including such compositions comprising (a) a polymerizable (meth)acrylate compound having a phosphate group, (b) a thiol compound, (c) a polymerizable compound having a double bond and no phosphate group, and (d) a photopolymerizable initiator. Non-leaching adhesives are not disclosed.

Takahashi et al discloses compositions which comprise a high-molecular weight thermoplastic saturated norbornene polymer having a molecular weight up to 2,000,000 and suitable for use as optical recording medium. These compositions are disclosed to be sheet-like or film-like articles useful as the substrate in the production of optical recording articles. No disclosure of adhesive compositions comprising norbornene monomers is present in this reference nor would the same be expected by one of ordinary skill in the art. Clearly non-leaching adhesives are not disclosed.

The references fail as anticipatory references and fail to render the invention obvious because among other reasons, they are devoid of any disclosure of curable, adhesive systems that are non-leaching.

In this application, the terms "curable", "non-leaching", and "adhesive" each clearly define a fundamental characteristic of the claimed invention that is properly construed as a limitation of the claim. The Examiner deems the "non-leaching", "curable", and "adhesive" limitations of the instant claims to be inherent in the prior art compositions.

It is well established that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art

reference." *Manual of Patent Examining Procedure* § 2131 (8th ed., Rev. 4, Oct. 2005), *citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987). The standard for rejection under 35 U.S.C. § 102 is identity.

Inherency arises when a single prior art reference fails to disclose the claimed invention per se, but the natural and invariable practice of the reference would necessarily and inherently meet all of the elements of the claimed invention. *Ethyl Molded Products v. Betts Package, Inc.*, 9 U.S.P.Q. 2d. 1001, 1032-1033. Inherency exists only when the prior inherent event can be established as a certainty; that an event may result from a given set of circumstances is not sufficient to establish anticipation by inherency. *See Phillips Petroleum Co. v. U.S. Steel*, 6 U.S.P.Q.2d 1065 at 1076-1077, 673 F. Supp. 1278 (D. Del. 1987).

Probabilities are not sufficient for prior art to anticipate an invention inherently; a prior inherent event cannot be established based on speculation or where a doubt exists. *Id.; E.I. du Pont v. Phillips Petroleum*, 2 U.S.P.Q.2d 1545 at 1552, 849 F. 2d 1430 (Fed. Cir. 1988); *Schering Corp. v. Precision-Cosmel Co.*, 227 U.S.P.Q. 278 614 F. Supp. 1368 (D. Del. 1985) and many other cases.

The instant claims recite highly specific features, which are characteristics that were experimentally determined and are required of the adhesive systems of the instant claims. That the systems are non-leaching could not have been established as a certainty without any doubt based on what is shown in the applied references. Speculation based on mere structural or descriptive similarity is insufficient to establish inherent anticipation, in view of a legal standard that requires absence of any doubt. It is applicant's discovery that certain curable, adhesive systems are non-leaching when cured. This is particularly important when

such systems are used in the applications discussed above. For the foregoing reasons, the rejection of claims as anticipated or as obvious should be withdrawn.

In view of the above, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

Respectfully Submitted,

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